Operating Instructions
Bedienungsanleitung
Mode d'emploi
Istruzioni per l'uso

STEREO DOUBLE CASSETTE TAPE DECK
STEREO-DOPPELKASSETTENBANDGERÄT
DOUBLE MAGNÉTOCASSETTE STÉRÉO
DOPPIA PIASTRA DI REGISTRAZIONE A CASSETTE STEREO

CT-S99WR

English; Page 1
Deutsch; Seite 21
Français; Page 39
Italiano; Pag. 57

- Photograph shows BLACK finished model
- Only the D/G (U.S. Military) model comes with the side panels.

"This product is manufactured to comply with the radio interference requirements of EEC Directive 76/889/EEC and 82/499/EEC."

Thank you for buying this Pioneer product.
Please read these operating instructions thoroughly, so you will know how to operate your model properly. After you have finished reading the instructions, put them away in a safe place for future reference.
For the sake of convenience, these operating instructions are based on the model HEM, and they can be used for the HB, HP, KU, KC, D and D/G models.
The differences between the models are given below.

HEM model:
For Europe excluding U.K. ('HEM' stamped on packing case): Power line voltage is AC 220 volts.

HB model:
For U.K. ('HB' stamped on packing case): Power line voltage is AC 240 volts.

HP model:
For Australia ('HP' stamped on packing case): Power line voltage is AC 240 volts.

KU and KC models:
For U.S.A. and Canada ('KU' or 'KC' stamped on packing case): Power line voltage is AC 120 volts.

D and D/G models:
For destinations excluding above ('D' or 'D/G' stamped on packing case): A 3-point (120 V/220 V/240 V) voltage selector switch is provided.

NOTE:
Depending upon the model, the design of the power plug and the power outlet differs.

The line voltage selector switch is located on the rear panel of the unit. Please check that it is set properly before plugging the power cord into an outlet. If it is not set properly, change the setting of it according to the LINE VOLTAGE SELECTION (D and D/G models only).

IMPORTANT NOTICE (For KU and KC models)

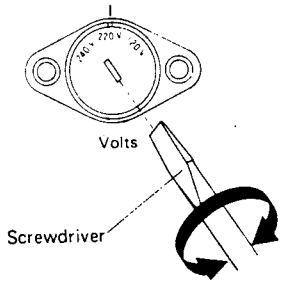
The serial number for this equipment is located on the rear panel. Please write this serial number on your enclosed warranty card and keep in a secure place. This is for your security.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

LINE VOLTAGE SELECTION (D and D/G models only)

Before your model is shipped from the factory, the switch is set to the power requirements of the destination; nevertheless, you should check that it is set properly before plugging the power cord into the AC outlet.

1. Disconnect the power cord.
2. Provide yourself with a medium size screwdriver.
3. Insert the screwdriver into the groove on the voltage selector and adjust to the voltage value of your area.



HEM (for Europe excluding U.K.), HB (for U.K.), HP (for Australia), KU (for U.S.A.) and KC (for Canada) models are not provided with a LINE VOLTAGE SELECTOR switch.

ENGLISH
DEUTSCH
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PIONEER

SAFETY INSTRUCTIONS

READ INSTRUCTIONS — All the safety and operating instructions should be read before the appliance is operated.

RETAIN INSTRUCTIONS — The operating instructions should be retained for future reference.

HEED WARNING — All warnings on the appliance and in the operating instructions should be adhered to.

FOLLOW INSTRUCTIONS — All operating and use instructions should be followed.

WATER AND MOISTURE — The appliance should not be used near water — for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

LOCATION — The appliance should be installed in a stable location.

WALL OR CEILING MOUNTING — The appliance should not be mounted to a wall or ceiling.

VENTILATION — The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

HEAT — The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

POWER SOURCES — The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

POWER-CORD PROTECTION — Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

POLARIZATION — If your purchased product is provided with a polarized power plug, please read the following instructions. This product is equipped with a polarized alternating current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

CLEANING — The appliance should be cleaned only with a polishing cloth or a soft dry cloth. Never clean with furniture wax, benzine, insecticides or other volatile liquids since they may corrode the cabinet.

POWER LINES — An outdoor antenna should be located away from power lines.

NONUSE PERIODS — The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

OBJECT AND LIQUID ENTRY — Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

DAMAGE REQUIRING SERVICE — The appliance should be serviced by Pioneer authorized service center or qualified service personnel when:

- The power-supply cord or the plug has been damaged; or
- Objects have fallen, or liquid has been spilled into the appliance; or
- The appliance has been exposed to rain; or
- The appliance does not appear to operate normally or exhibits a marked change in performance; or
- The appliance has been dropped; or the enclosure damaged.

SERVICING — The user should not attempt to service the appliance beyond that described in the operating instructions. For all other servicing, contact the nearest Pioneer authorized service center.

OUTDOOR ANTENNA GROUNDING — If an outside antenna is connected to the antenna terminal, be sure the antenna system is grounded so as to provide some protection against voltage surges and built up static charges.

In the U.S.A. section 810 of the National Electrical Code, ANSI/NEPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Fig. A.

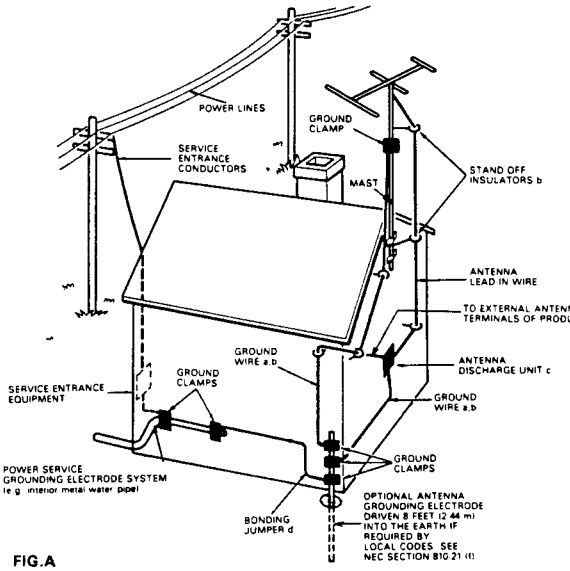
POWER LINES
GROUND CLAMP
SERVICE ENTRANCE CONDUCTORS
MAST
STAND OFF INSULATORS b
ANTENNA LEAD IN WIRE
TO EXTERNAL ANTENNA TERMINALS OF PRODUCT
ANTENNA DISCHARGE UNIT c
GROUND WIRE a,b
GROUND CLAMPS
SERVICE ENTRANCE EQUIPMENT
GROUND WIRE a,b
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (e.g. interior metal water pipe)
BONDING JUMPER d
OPTIONAL ANTENNA GROUNDING ELECTRODE DRIVEN 8 FEET (2.44 m) INTO THE EARTH IF REQUIRED BY LOCAL CODES SEE NEC SECTION 810.21 (f)

FIG.A

a) Use No. 10 AWG (5.3 mm²) copper, No. 8 AWG (8.4 mm²) aluminum, No. 17 AWG (1.0 mm²) copper-clad steel, bronze wire, or larger as ground wire.

b) Secure antenna lead-in and ground wires to house with stand-off insulators spaced from 4 feet (1.22 meters) to 6 feet (1.83 meters) apart.

c) Mount antenna discharge unit as closely as possible to where lead-in enters house.

d) Use jumper wire not smaller than No.6 AWG (13.3 mm²) copper or equivalent when separate antenna-grounding electrode is used.

IMPORTANT 1

The lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

CAUTION:
TO PREVENT THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

IMPORTANT 2

If the apparatus is fitted with AC mains power outlet(s), see REAR PANEL FACILITIES for convenient connection of additional Hi-Fi component(s). Make all connections to the AC outlet(s) and the signal terminals first. Connect the plug to the wall socket last, make sure that the power switch is off. Disconnect the wall plug when the equipment is not in (regular) use, e.g. when on vacation.

FOR USE IN THE UNITED KINGDOM

The wires in this mains lead are coloured in accordance with the following code:

Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured marking identifying the terminals in your plug proceed as follows:

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.

Equipment sold in the U.K. is not supplied with a power plug.

CONTENTS

Features 3
Connections 3
Panel facilities 4
Reverse mode switch 6
Playback 7
Random programmed playback 8
Recording 10
Automatic recording muting
(making nonrecorded intervals) 12
Tape copying
(from deck I to deck II) 13
Tape editing 14
Recording and playback using the audio timer 15
Cassette tapes 16
Maintenance 17
Noise reduction systems 17
Troubleshooting 18
Specifications 19

FEATURES

- Soft-touch mechanism using electronic logic control.
- Random programmed playback function allows automatic play of up to a maximum 20 tracks (10 per tape side).
- Random programmed copy function for convenient tape editing.
- Recording muting function for covenient tape editing.
- Skip search/music search function allows tracks on either deck to be found quickly.
- Noise reduction systems (dbx, Dolby NR B/C types) eliminate tape hiss noise.
- Timer standby function.
- Parallel recording function allows simultaneous recording of a single source on two tapes.
- Auto tape selector function automatically detects the kind of tape used.
- Auto reverse function for automatic recording and playback.
- Relay play function convenient for parties and other extended playback.
- Relay recording function allows convenient recording of long radio broadcasts, etc.
- Tape copy function with numerous applications:
(Normal speed copying, high-speed copying; normal speed and high-speed random programmed copying)

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CONNECTIONS

- Read through the operating instructions of the stereo components you plan to connect with this unit.
- Do not switch on the power until all the connections have been completed.
- The top jacks are for the left (L) channel; the bottom jacks are for the right (R) channel.
- Make certain the connectors are pushed all the way in. An improper connection or poor contact will result in no sound, or will degrade the sound.

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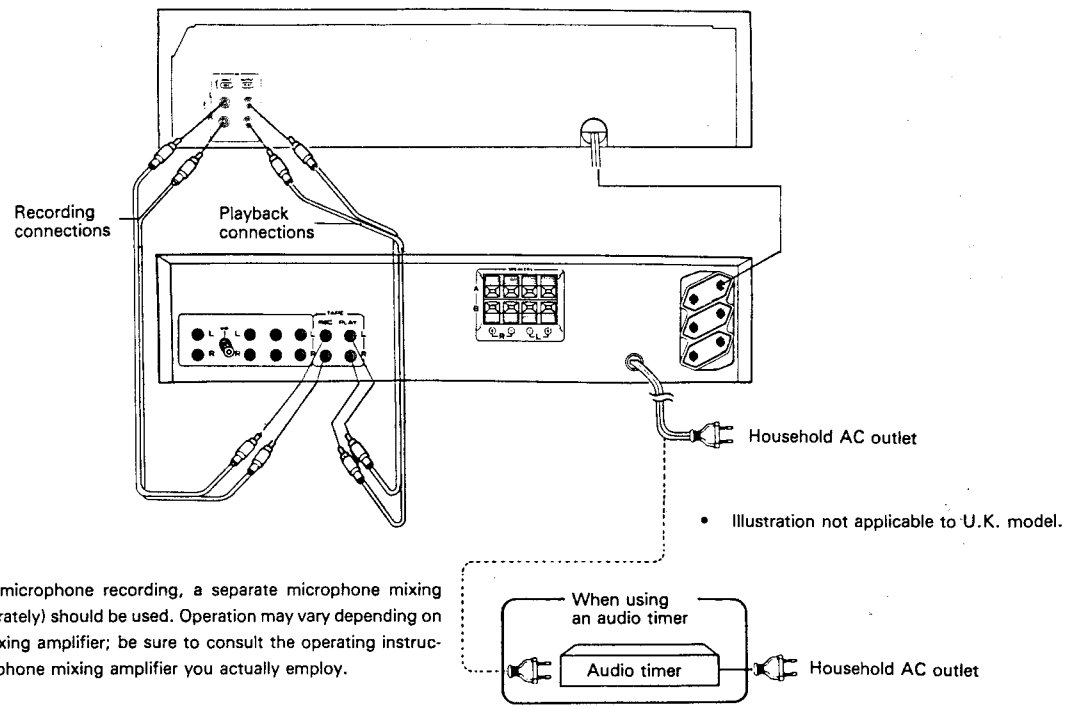
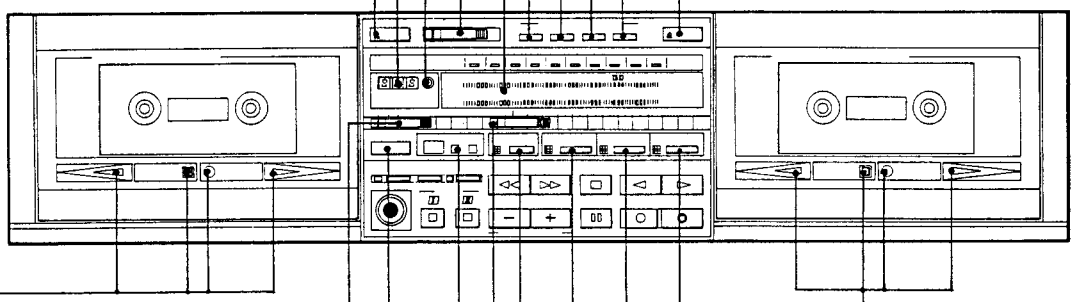


- Illustration not applicable to U.K. model.

- When performing microphone recording, a separate microphone mixing amplifier (sold separately) should be used. Operation may vary depending on the microphone mixing amplifier; be sure to consult the operating instructions for the microphone mixing amplifier you actually employ.

PANEL FACILITIES



Reset button

TAPE COUNTER

Indicates the transport position of the tape loaded in deck I with a threedigit counter.

EJECT button

If the power is disconnected while a tape is running, the eject function will not operate. In such a case, turn on the power once again, and then press the EJECT button.

REVERSE MODE switch

LEVEL meter

NOISE REDUCTION switches

EJECT button

Deck I

Deck II

Mode indicators

◁ : Lights during the reverse mode. Flashes during the pause mode, and when inputting random programmed play selections on tape side B.

□ : Lights during playback mode.

○ : Lights during recording mode. Flashes during recording muting mode.

▷ : Lights in the forward mode. Flashes during the pause mode , and when inputting random programmed play selections on tape side A.

Mode indicators

RELAY switch

PARALLEL REC switch

SYNCHRO COPY/NORMAL switch (normal speed)

SYNCHRO COPY/HIGH SPEED switch (2x speed)

REC LEVEL control

NR SYSTEM indicators

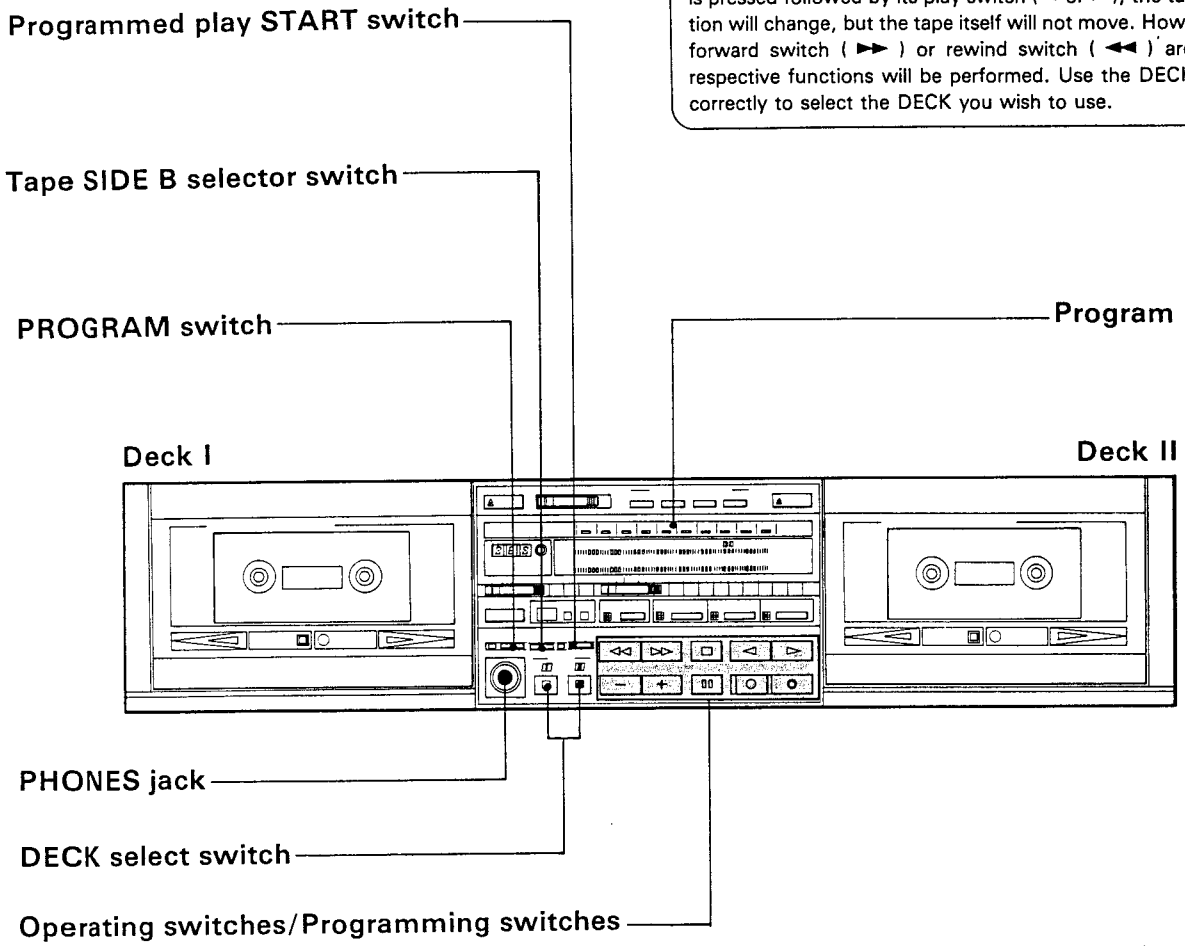
POWER switch

TIMER STD-BY switch

Used only when performing unattended recording or wake-up playback. Normally, leave in the OFF position.

Deck select switches and operating switches:

During recording or playback, even if the opposite DECK select switch is pressed followed by its play switch (◄ or ►), the tape travel direction will change, but the tape itself will not move. However, if the fast forward switch (►►) or rewind switch (◄◄) are pressed, the respective functions will be performed. Use the DECK select switch correctly to select the DECK you wish to use.



These switches are used both for operating deck I and deck II, and also for programming selections for random programmed playback.

[When used as operating switches]

◄◄ : Rewind switch

►► : Fast forward switch

■ : Stop switch. Press also to stop parallel recording, normal speed copying, high-speed copying, normal speed edit copying, and random programmed tape copying.

◄ : Reverse play switch. Press to play back the reverse side of the tape (the side opposite from the side visible in the holder).

► : Forward play switch. Press to play back the forward side of the cassette tape (the side visible in the holder).

– : Press when performing skip search and music search (see page 9).

\+ : Pause switch. Press to temporarily stop the tape travel. To restart the tape travel, press once again. The pause function does not operate when the deck is in the fast forward or rewind modes.

● : Recording switch. The deck cannot be placed in the recording mode if a cassette with broken erasure prevention tabs is loaded, or if no tape cassette is loaded.

O : Recording muting switch. Press during recording to eliminate unwanted portions, or to create a non-recorded interval between tracks (see page 12).

[When used as programming switches]

Used during random programmed play operation (see page 8).

- Noise reduction manufactured under license from Dolby Laboratotries Licensing Corporation.
- "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

- dbx is a trademark of dbx Incorporated.

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REVERSE MODE SWITCH

REVERSE MODE SWITCH

⇄ Position

[During playback and recording]

With this function, recording or playback can be performed in a single direction (on a single side of a cassette tape). When the tape is wound fully onto one of the reels, the deck will automatically enter the stop mode.

⟲ Position

[During playback].....Repeat playback

Playback will continue until both sides of the tape have been played back a total of 12 times (six sides each), or until the stop switch (■) is pressed. If the pause switch (▮▮) is pressed during the repeat playback, the playback will be reset for an additional six full plays from the point at which the playback is restarted (using a C-90 tape, a maximum of nine hours of continuous relay play is possible).

[During recording] .....Auto-reverse recording

When performing recording, auto-reverse can be performed only from the forward direction to the reverse direction. As a result, when auto-reverse recording is desired, always start from the forward direction. If the tape is started from the reverse direction, the tape travel will automaticaly stop when the tape reaches its end on the reverse side, without performing auto-reverse (the forward side will not be recorded).

RELATIONSHIP BETWEEN REVERSE MODE SWITCH AND TIMER OPERATION

- **Unattended recording**
  (relay recording from deck I to deck II can be performed).

⇄ Position

When the single-direction recording on deck I is completed, recording will begin on deck II. When the single-direction recording on deck II is completed, the deck will automatically stop.

⟲ Position

When the auto-reverse recording on deck I is completed, deck II will enter the recording mode. When auto-reverse recording is completed on deck II, the deck will automatically stop (when using C-90 tapes, a maximum of 3 hours of relay recording can be performed).

- **Wake-up playback** (a function of deck I only).

⇄ Position

When single-direction playback is completed on deck I, the deck automatically stops.

⟲ Position

Repeat playback will be performed on deck I: side A → side B → side A → side B... to a maximum of 12 sides playback (six times each side). When the twelfth side finishes playback, the deck will stop. Relay playback cannot be performed by the audio timer.

RELATIONSHIP BETWEEN REVERSE MODE SWITCH AND RELAY OPERATION

- **Relay recording**
  (deck I → deck II, or deck II → deck I) can be performed.

⇄ Position

When single-direction recording on one deck is completed, recording will begin on the other deck; when that recording is completed, the deck automatically stops.

⟲ Position

When auto-reverse recording on one deck is completed, recording will begin on the other deck; when that recording is completed, the deck automatically stops.

- Relay playback
  (deck I → deck II, or deck II → deck I) can be performed.

⇄ Position

When single-direction play back is completed on one deck, playback will begin on the other deck; when the single-direction playback is completed, the deck automatically stops.

⟲ Position:

Auto-reverse playback on deck I will be followed by auto-reverse playback on deck II, followed by auto-reverse playback on deck I, etc., up to a maximum playback of 23 sides, and the deck will then automatically stop (when using C-90 tapes, a maximum of 17 hours 15 minutes of relay playback is possible).

AUTO REVERSE FUNCTION

This tape deck is equipped with rotating heads; when the cassette's leader tape (the part of the tape without magnetic media) is detected by the sensor, the heads rotate to automatically reverse the playback or recording surface (an optical leader-tape detector is used). This is a convenient feature which eliminates the need to manually reverse the tape cassette in the deck.

NOTE:

When the auto-reverse function operates during playback or recording, the tape's sound is interrupted briefly; in order to keep this interruption as short as possible, a leader tape sensor is provided. This sensor detects the clear leader material and operates the auto reverse mechanism, but it may not operate properly in the following cases:

- *If a spotlight or other strong light is directed near the heads.*
- *If characters or marks are imprinted on the leader tape.*
- *If the tape is damaged severely.*
- *If the leader tape is encountered within about eight seconds after the beginning of tape travel.*
- *When performing random programmed playback.*

CHANGING THE DIRECTION OF TAPE TRAVEL

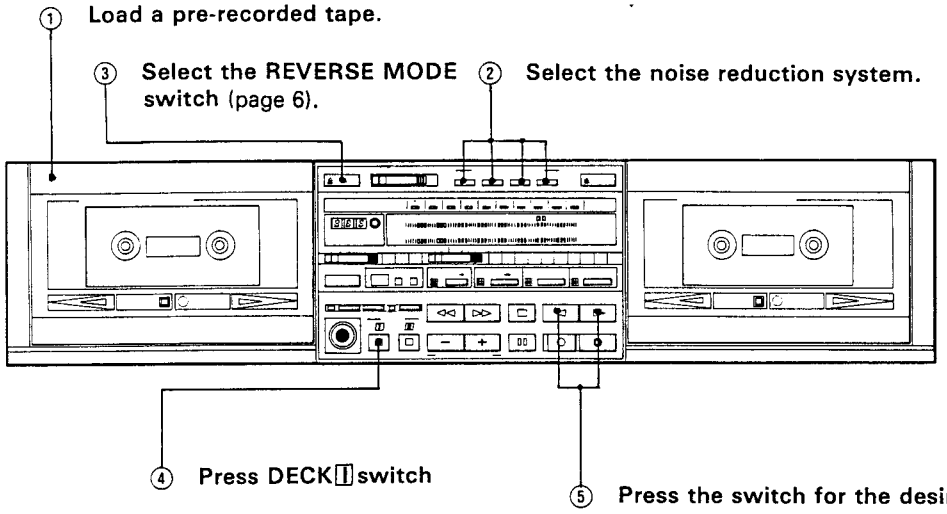
To change the direction of tape travel, first set the tape to the pause mode, and then press the reverse play switch (◄) or forward play switch (►).

NOTE:

When the POWER switch is first turned on, the tape direction will be set automatically to the same direction set before the power was previously turned off. Before operating the tape deck, be sure to confirm the direction of tape winding and tape travel.

PLAYBACK

SINGLE PLAYBACK (A function of both deck I and deck II)

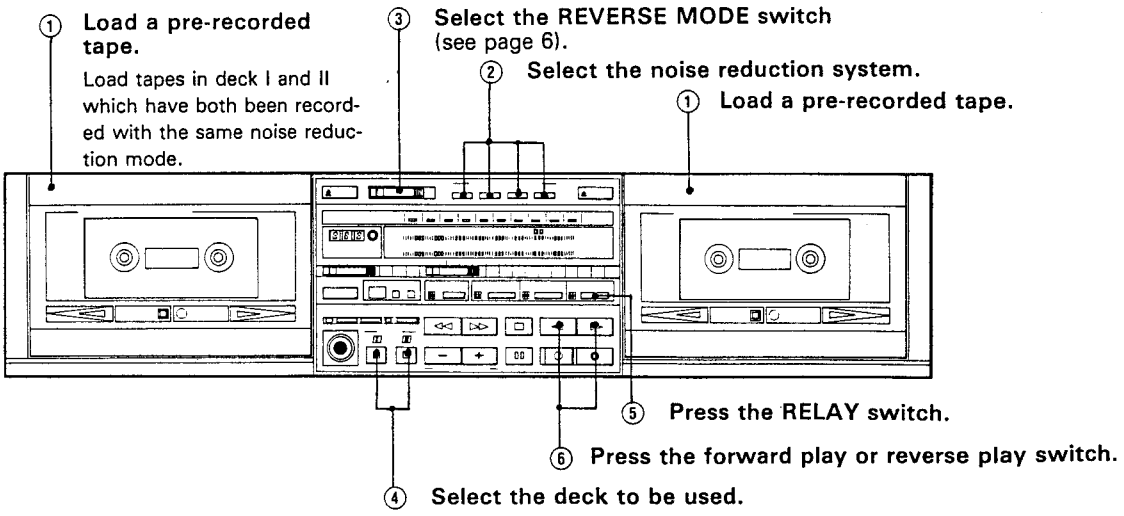

① Load a pre-recorded tape.
③ Select the REVERSE MODE switch (page 6).
② Select the noise reduction system.
④ Press DECK I switch
⑤ Press the switch for the desired tape side.

NOTE:

- *When the POWER switch is set to ON, the unit is automatically set to the deck I operation mode. When operating deck II, press the DECK selector switch II.*
- *Playback can be performed on either deck I or deck II, but both decks cannot be set to playback simultaneously.*

RELAY PLAYBACK (Continuous playback deck I → deck II, or deck II → deck I)

When the tape loaded in one deck comes to the end of its playback, it stops, and the other deck enters the playback mode. While the second tape is playing, a new tape can be replaced in the first deck in order to perform continuous playback of different tapes, a convenient feature for party background music, etc.


① Load a pre-recorded tape.
Load tapes in deck I and II which have both been recorded with the same noise reduction mode.
③ Select the REVERSE MODE switch (see page 6).
② Select the noise reduction system.
① Load a pre-recorded tape.
⑤ Press the RELAY switch.
⑥ Press the forward play or reverse play switch.
④ Select the deck to be used.

NOTE:

- *When the reverse mode switch is set to the ⟲ position in order to perform continuous relay playback from one deck to another, be sure to begin playback from the forward direction.*
- *To cancel relay playback, press the RELAY switch once again.*

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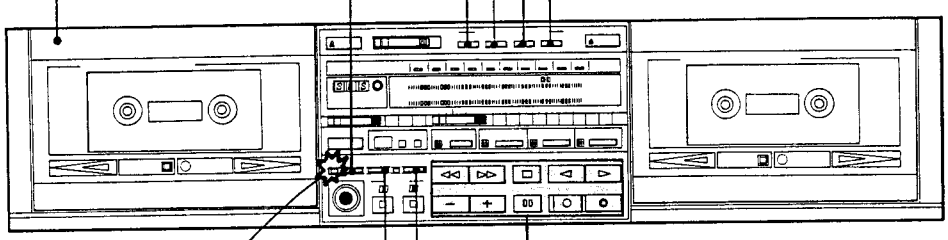
RANDOM PROGRAMMED PLAYBACK

RANDOM PROGRAMMED PLAYBACK (A function of deck I only).

A maximum of 20 tracks (ten on each side) can be programmed for playback in any desired order.



① **Load a pre-recorded tape.**

③ **Press the PROGRAM switch.**

② **Select the noise reduction system.**

When the program indicator is lighted, the operating switches function as programming switches.

④ **Press the operating switches (programming switches) in the order in which you wish to program the tracks.**

⑤ **Press the SIDE B switch to program selections on side B. Then perform step ④.**

⑥ **Press the START switch.**
The programmed contents will be displayed once in the order programmed, and playback will then begin.

- When the programmed selections have all been played back, the tape will stop, and the random programmed play mode will be cancelled.
- To cancel the random programmed playback before its end, press the stop switch (■).

Q & A REGARDING RANDOM PROGRAMMED PLAYBACK

If more than 10 tracks are programmed by mistake?
When the tenth programing switch is pressed, the program indicator will flash and the unit will automatically switch to side B. As a result, the contents of selections made beyond the tenth will be memorized for side B.

To playback the same track more than once?
Press the same programing switch the number of times you wish to play back the track (up to ten times).

To change the playback order?
The playback order cannot be revised during playback; playback will be performed in the order programmed. After pressing the stop switch (■) to erase all memorized tracks, re-program the selections in the desired order.

To cancel the currently playing track and listen to the next memorized track?
Wait at least eight seconds after beginning the playback mode, and then press the "+" operating switch.

To listen again to the same track?
Wait at least eight seconds after beginning the playbck mode, and then press the "−" operating switch.

If a track is memorized by mistake?
Press the PROGRAM switch again. The memory contents will all be cancelled, and re-programming from the beginning can be performed.

To cancel the random programmed play mode before starting playback?
Press the DECK selector switch I or II.

NOTE:
The random programmed playback, skip search, and music search functions may not operate properly with the following kinds of tape, but this is not a malfunction of the tape deck.
- *Tapes without non-recorded intervals of about 4 seconds between tracks.*
- *Tapes of classic or other music with passages which continue at a low level for several seconds, or in which the music is interrupted for several seconds.*
- *Tapes of conversation, comedy, etc., in which the sound is interrupted for several seconds.*
- *Tapes which contain substantial levels of noise in the non-recorded intervals between tracks.*

SKIP SEARCH AND MUSIC SEARCH (Functions of both deck I and deck II)

These functions allows you to select specific tracks in a different way from random programmed playback.

SKIP SEARCH

This function allows you to search for a specific track up to ten tracks before or after the currently playing position.
To select a track after the currently playing track, press the operating switch "+" the number of times corresponding to the number of tracks from the current position. To select an earlier track, press the "−" operating switch.

NOTE:

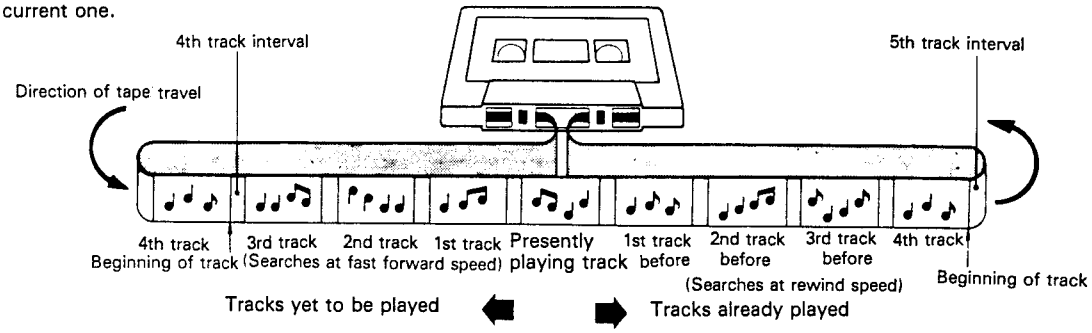
- *If you press the "+" operating switch more times than the number of tracks actually remaining on the current tape side, the search function will continue its search onto the opposite side of the tape. However, if the "−" operating switch is pressed more times than the number of tracks on the tape preceding the present position, the search function will rewind the tape to its beginning and automatically stop there.*
- *Note that during the time you are pressing the switches to set the number of tracks to be skipped, the search function is already counting down the number of track intervals (since the search function begins the instant the switch is first pressed, if an interval between tracks is encountered while you are still pressing the switch, the number of tracks will be decremented by one).*

MUSIC SEARCH

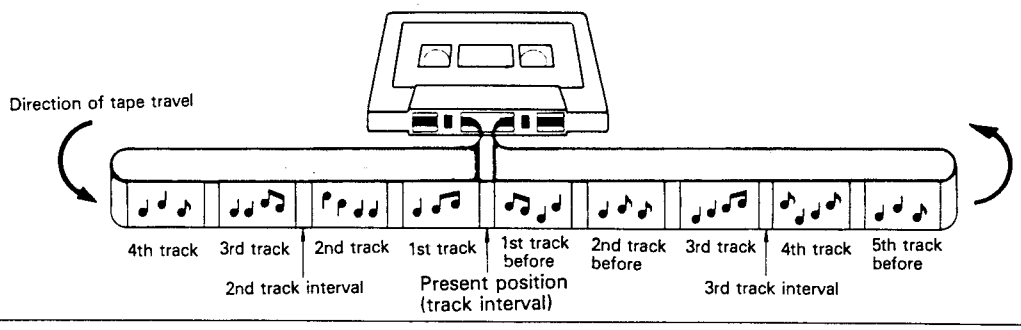
This function is convenient when you wish to listen again to the currently playing track, or to the next track.
To listen to the next track, press the "+" operating switch once. To listen again to the currently playing track, press the "−" operating switch once.

HOW TO COUNT TRACKS

When counting from the middle of a track now playing:
For example, in order to search for the fourth track after the currently playing track, press the "+" operating switch four times, in order to skip over four intervals between tracks. In order to find the fourth track before the currently playing track, however, the "−" operating switch must be pressed five times, in order to skip over five intervals between tracks, and thus arrive at the beginning of the fourth track before the current one.



When counting from a non-recorded interval between tracks:
For example, in order to find the third track after the current position, press the "+" operating switch two times in order to skip over the two intervening tracks, and thus arrive at the third track. In order to find the third track before the current position, however, the "−" operating switch must be pressed three times in order to skip over the three intervening tracks and thus arrive at the beginning of the desired (third) track before the current position. [When counting from either the middle of a track, or from an interval between tracks, it may help to keep in mind that the search function in fact counts the intervals between tracks.]



ENGLISH

RECORDING

SINGLE RECORDING (A function of both deck I and deck II)

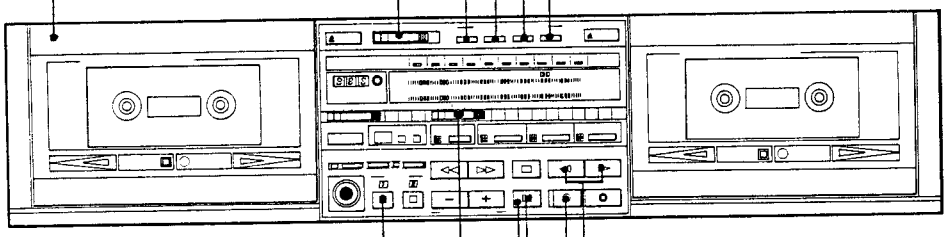
Recording can be performed on either deck I or II.

① **Load the recording tape.**

Be sure to match the direction of tape winding on the cassette with the direction of tape travel in the deck.

③ **Select the REVERSE MODE switch** (page 6).

② **Select the noise reduction system.**



⑤ **Press the pause (■■) switch, followed by the recording switch (●) to place the deck in the recording standby mode.**

④ **Press DECK ◫ switch**

⑥ **Select the direction of tape travel.**

⑦ **Adjust the recording level**

⑧ **Press the pause (■■) switch to begin recording.**

Erasure prevention tabs?

If the erasure prevention tabs have been broken out of the tape cassette, the deck will not begin recording, even if the recording switch (●) is pressed (see page 16). Be sure to check that both tabs are present, particularly when performing auto-reverse recording.

ADJUSTING THE RECORDING LEVEL

The adjustment of the recording level is the most important factor in achieving good recording results. A high level is good for the signal-to-noise ratio and the dynamic range but an excessively high level distorts the sound. If the level is made too low out of fear of distorting the sound, irritating tape hiss will mar the recording. Depending on the manufacturer and type of tape, the characteristics of a tape differ even when the same kind is used. Making a setting just near the tape's maximum recording level will do full justice to a tape's characteristics and result in a good-quality recording.

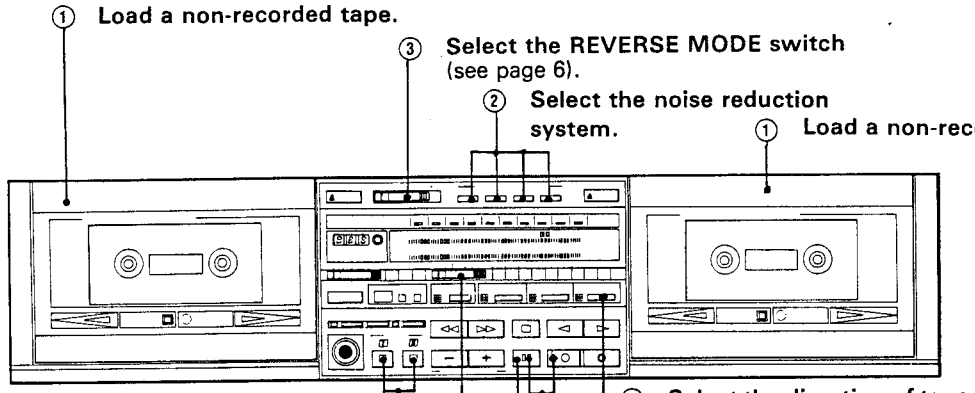
Adjust the REC LEVEL volume control so that the level meter's "0 dB" just lights. No harm will be done if the "+6 dB" indicator lights momentarily at peaks.

NOTE DURING RECORDING:

- *The DD mark on the level meter indicates the reference level for the Dolby NR system.*
- *In reality, the optimum recording level may differ somewhat, depending on the music source and type of tape used. In order to deliver the best results of which your tapes are capable and to produce better recordings, set the recording level after actual testing, by listening carefully to the sound produced and adjusting it to a level most pleasing to you.*
- *The level meter may react differently during recording and playback of the same music tape; this is due to differences in tape sensitivity, and creates no problem so long as the variation is not severe.*

RELAY RECORDING (For recording of long programs)

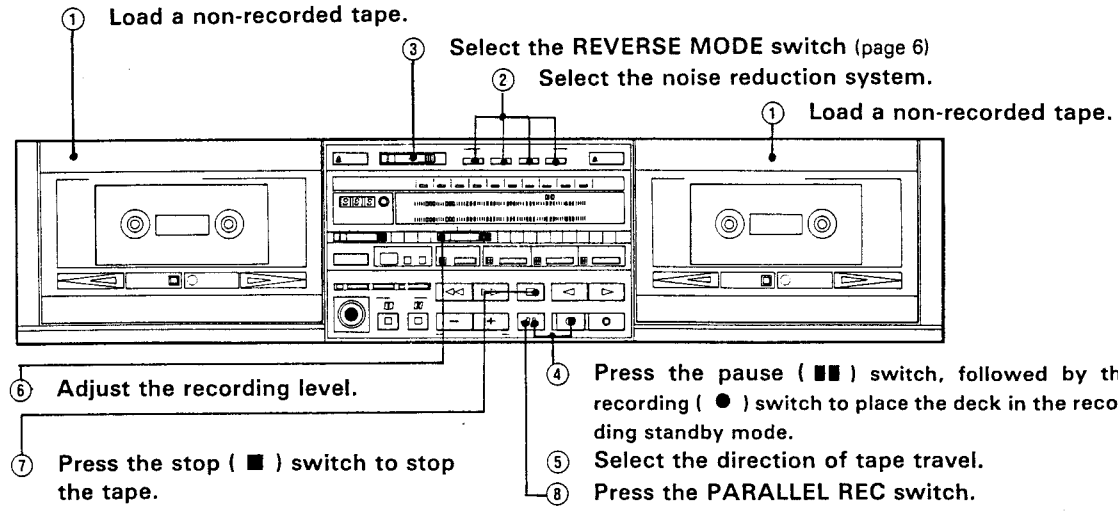
When the tape loaded in one deck comes to the end of its recording and automatically stops, the other deck automatically enters the recording mode. In this way, continuous (relay) recording can be performed from deck I to deck II, or from deck II to deck I. This is a convenient feature when recording long radio programs.


① Load a non-recorded tape.
③ Select the REVERSE MODE switch (see page 6).
② Select the noise reduction system.
① Load a non-recorded tape.
⑥ Select the direction of tape travel.
④ Select the DECK switch to be used.
⑦ Adjust the recording level.
⑤ Press the pause (■■) switch, followed by the recording switch (●), to place the deck in the recording standby mode.
⑧ Press the RELAY switch.
⑨ Press the pause switch (■■) to begin recording.

- *If you wish to continue the recording for an even longer time, as each tape finishes recording, replace it with a fresh tape, and press the relay switch once again.*
- *When one deck completes recording, the other deck will automatically enter the recording mode, even if it was previously in the fast forward or rewind mode. As a result, when performing relay recording, be sure to adjust the tape beforehand to the proper position to begin recording.*
- *To cancel the relay recording mode, press the relay switch once again.*

PARALLEL RECORDING (To produce two tapes simultaneously)

One-touch simultaneous recording can be performed on deck I and deck II of the signals from the rear panel LINE IN (REC) terminals (signals from record player, CD player, etc.). This is a convenient feature when you wish to produce two identical tapes.


① Load a non-recorded tape.
③ Select the REVERSE MODE switch (page 6)
② Select the noise reduction system.
① Load a non-recorded tape.
⑥ Adjust the recording level.
④ Press the pause (■■) switch, followed by the recording (●) switch to place the deck in the recording standby mode.
⑦ Press the stop (■) switch to stop the tape.
⑤ Select the direction of tape travel.
⑧ Press the PARALLEL REC switch.

- *The parallel recording mode will not take effect unless both decks are initially in the stop mode.*
- *When the pause switch (■■) is pressed, both decks will be placed in the recording standby mode.*
- *If the recording muting switch (O) is pressed, both decks will enter the recording muting mode.*
- *The noise reduction system selected is applied to both decks.*
- *Since the recording level adjustment is applied to both decks, both tapes should be of the same kind.*
- *If tapes of differing lengths are used, the parallel recording mode will be cancelled when the shorter tape reaches its end. Be sure to use tapes of the same length.*

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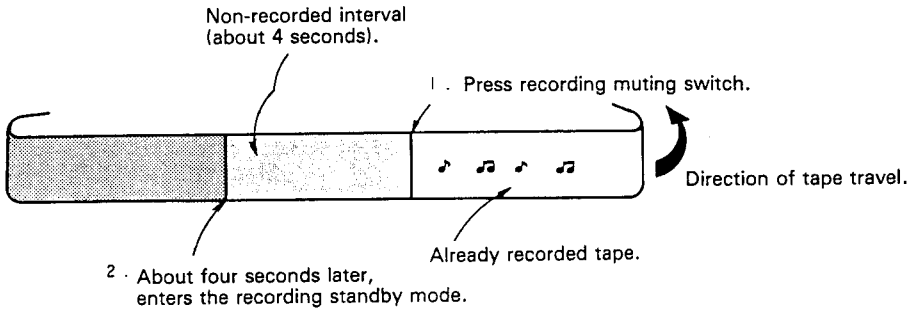
AUTOMATIC RECORDING MUTING (Making non-recorded intervals)

TO AUTOMATICALLY PRODUCE A 4-SECOND NON-RECORDED INTERVAL

If the recording muting switch (O) is pressed during recording, a non-recorded interval of about four seconds length will be produced.

This function should be used in order to make the 4-second non-recorded intervals between tracks required for the random programmed play, skip search, and music search functions.

1. At the point you wish to produce the non-recorded interval, press the recording muting switch (O).
2. About four seconds later, the tape travel will automatically stop, and the deck will enter the recording standby mode.
3. To resume recording, press the pause switch (▮▮).


Non-recorded interval
(about 4 seconds).
1 . Press recording muting switch.
Direction of tape travel.
Already recorded tape.
2 . About four seconds later,
enters the recording standby mode.

TO PRODUCE A NON-RECORDED INTERVAL SHOTER THAN FOUR SECONDS

To place in the recording standby mode:
Immediately after pressing the recording muting switch (O), press the pause switch (▮▮). To resume recording, press the pause switch (▮▮) again.

To link the recording continuously:
After pressing the recording muting switch (O), press the recording switch (●) before the deck enters the recording standby mode.

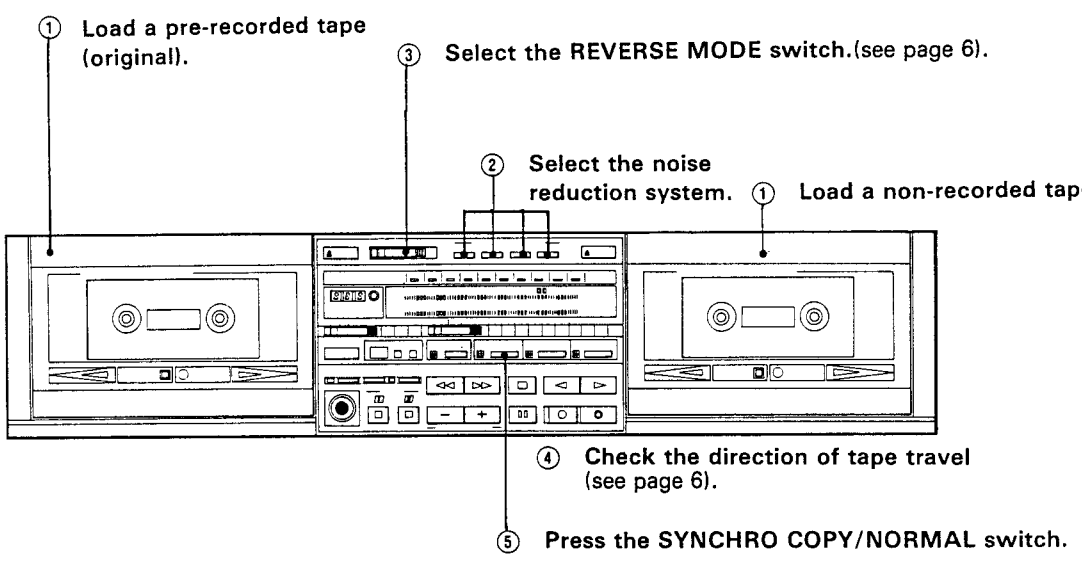
TO PRODUCE A NON-RECORDED INTERVAL LONGER THAN FOUR SECONDS

To place in the recording standby mode:
Hold the recording muting switch (O) depressed for the necessary length of time. When the switch is released, the deck will simultaneously enter the recording standby mode. To resume recording, press the pause switch (▮▮).

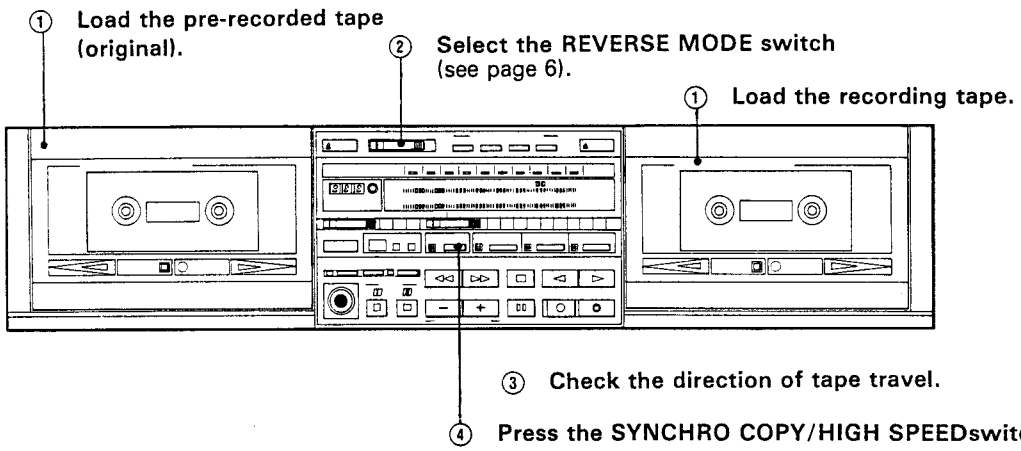
To link the recording continuously:
Hold the recording muting switch (O) depressed for the necessary length of time. When you wish the recording to resume, press the recording switch (●), then release your finger from the recording muting switch (O) followed by the recording switch (●). Recording will begin immediately when the recording muting switch is released.

TAPE COPYING (From DECK I to DECK II)

NORMAL SPEED COPYING (To copy an entire tape while listening to its playback)


① Load a pre-recorded tape (original).
③ Select the REVERSE MODE switch.(see page 6).
② Select the noise reduction system.
① Load a non-recorded tape.
④ Check the direction of tape travel (see page 6).
⑤ Press the SYNCHRO COPY/NORMAL switch.

HIGH-SPEED COPYING (To copy an entire tape in a short time).


① Load the pre-recorded tape (original).
② Select the REVERSE MODE switch (see page 6).
① Load the recording tape.
③ Check the direction of tape travel.
④ Press the SYNCHRO COPY/HIGH SPEEDswitch.

NOTE ABOUT TAPE COPYING:

- *When the SYNCHRO COPY switch is pressed, the decks will not enter the tape copy mode unless both are initially in the stop mode.*
- *When repeating the tape copying, be sure to leave the original tape in deck I. Making a copy of a copy will result in a deterioration in sound quality.*
- *When making tape copies, adjustment of the recording level is not required.*
- *During high-speed copying, the recording muting function will not operate.*
- *If tapes of differing lengths are used, the tape copy mode will be cancelled when the shorter tape reaches its end. Be sure to use tapes of the same length.*
- *When performing tape copying, the copy will be produced with the same noise reduction effects as those used on the original tape, regardless of the position of the NOISE REDUCTION switches. For example, if the original tape was recorded with the Dolby C type noise reduction, the copy will be produced with the same Dolby C type noise reduction effects.*

NOTE DURING HIGH-SPEED COPYING

When performing high-speed copying with this unit, if a television is used nearby, a high-pitched interference sound may be heard on the recording. In this case, either use the normal-speed copying function, or turn off the power to the television

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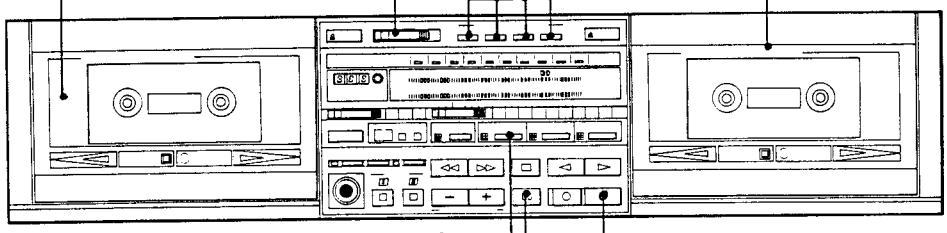
TAPE EDITING

NORMAL SPEED COPYING (Editing of continuously recorded tapes)

This function allows you to edit undesired material (commercials, narration, etc.) from a continuously recorded tape of a radio broadcast, in order to produce a tape of music only.



① Load a pre-recorded tape (radio broadcast recording, etc.).

③ Select the REVERSE MODE switch (see page 6).

② Select the noise reduction system.

① Load a non-recorded tape.

④ Check the direction of tape travel.

⑤ Press the SYNCHRO COPY/NORMAL switch.

⑥ When the tape reaches a part you wish to eliminate, press the recording muting switch.

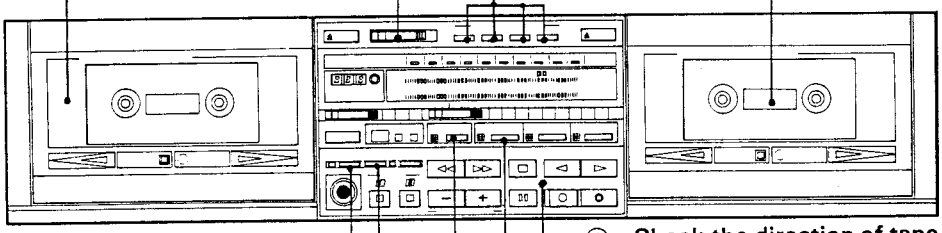
Deck I will continue in the playback mode, but a non-recorded interval of about four seconds length will be produced on deck II, and the deck will then enter the recording standby mode.

⑦ When you wish to resume recording, press the pause switch.

Deck II will once again enter the recording mode.

RANDOM PROGRAMMED TAPE COPYING (Editing of selected tracks only)

Once again review the procedures for random programmed playback (page 8).



① Load a music tape.

③ Select the REVERSE MODE switch (see page 6).

② Select the noise reduction system.

① Load a non-recorded tape.

④ Check the direction of tape travel on deck II.

⑥ Press the programming switches in the order of the tracks to be copied.

⑧ When listening to the playback sound at normal speed while copying, press the SYNCHRO COPY/normal switch.
When you wish to copy the tape at high speed, press the SYNCHRO COPY/HIGH-SPEED switch.

⑤ Press the PROGRAM switch.

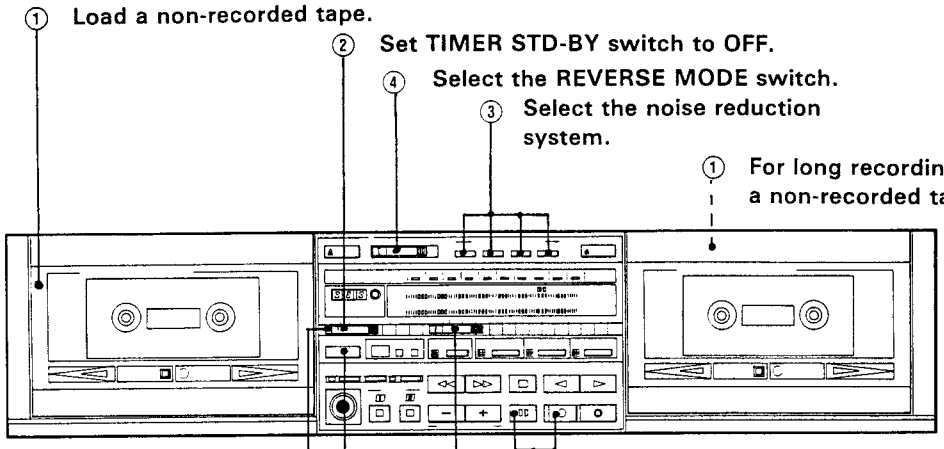
⑦ Press when recording tracks on side B; then, perform step ⑥.

RECORDING AND PLAYBACK USING THE AUDIO TIMER

UNATTENDED RECORDING (Timer relay recording operates from deck I to deck II only)

Relay recording can be performed via timer from deck I to deck II, thus allowing you to record even long programs while absent.

[Example] When using C-90 tapes, up to three hours of recording can be performed.



① Load a non-recorded tape.

② Set TIMER STD-BY switch to OFF.

④ Select the REVERSE MODE switch.

③ Select the noise reduction system.

① For long recordings, load a non-recorded tape.

⑤ Set POWER switch to ON.

⑥ Tune in the desired station with your stereo tuner.

⑦ Press the pause switch (▮▮) followed by the recording switch, to place to the recording standby mode.

⑧ Check the direction of tape travel.

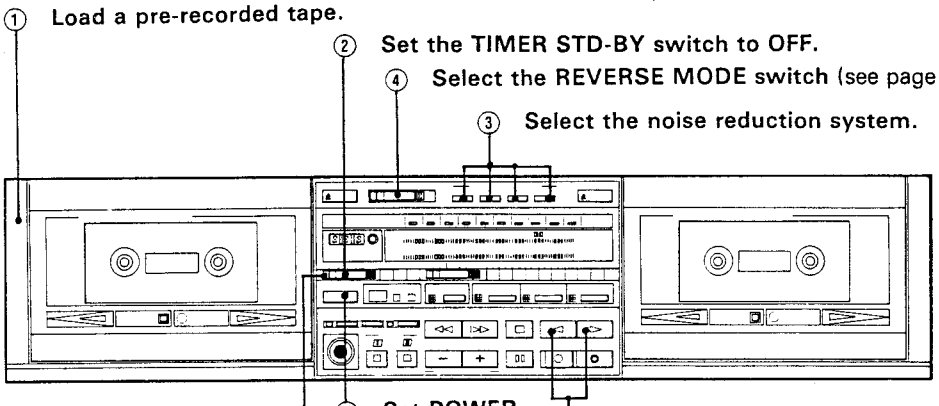
⑨ Adjust the recording level.

⑩ Set the audio timer.
When this is done, the audio timer will turn all connected components OFF.

⑪ Set the TIMER STD-BY switch to REC.
At the time set on the audio timer, the power will turn ON, and recording will begin automatically.

When performing unattended recording, relay recording is automatically designated. If you do not wish to perform relay recording, be sure not to leave any tape cassette in deck II.

WAKE-UP PLAYBACK (A function of deck I only)



① Load a pre-recorded tape.

② Set the TIMER STD-BY switch to OFF.

④ Select the REVERSE MODE switch (see page 6).

③ Select the noise reduction system.

⑤ Set POWER switch to ON.

⑥ Press the forward play or reverse play switch.

⑦ Adjust the sound volume at the stereo amplifier.

⑧ Set the audio timer.
When this is done, the audio timer will turn all connected components off.

⑨ Set the TIMER STD-BY switch to PLAY.
At the time set on the audio timer, the power will be turned on and playback will begin automatically.

Operations may vary depending on the timer used; be sure to consult the operating instructions for the timer you actually employ.

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CASSETTE TAPES

CHECK CASSETTE BEFORE USE

Slack or protruding tape

If the tape protrudes from the cassette as shown in Fig. A or is slack, the tape may run without passing between the capstan and the pinch roller and so may be damaged. Take up the slack by inserting a pencil through the reel hub and turning it as shown in Fig. A.
Some tapes provide a tape stopper to prevent tape slack. Make sure that you remove the tape stopper before inserting the tape into the deck.

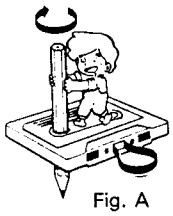


Fig. A

Erasure prevention tabs

Cassette tapes are provided with erasure prevention tabs, as shown in Fig. B, which act as a protection device to prevent the accidental erasure of a recording which you want to keep. If you remove the tabs, as shown in Fig. B, with a screwdriver you will be able to prevent erasure if you accidentally set the tape deck to the recording mode by depressing the REC switch.
To re-record, cover the tab opening with adhesive tape (Fig. C).

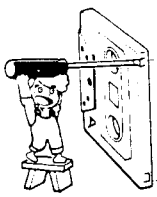


Fig. B

Fig. C

NOTE:
Cassette tapes are provided with two tabs (A or 1 and B or 2) so you can protect the recordings on both sides.

HINTS ON HANDLING CASSETTE TAPES

- **Take care with the leader tape.**
  A leader tape is attached to the beginning of the cassette tape (you cannot record on it). It takes about 5 seconds for it to pass through, so bear this point in mind when recording.

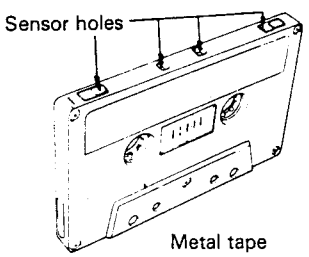
- **Storing cassette tapes**
  Do not store your cassette tapes without putting them in their cases since dust and dirt will adhere to them. Always store in a location which is free from dust, dirt, oil, and magnetic effects.

- **Do not use the C-120 tapes.**
  The C-46, C-60 and C-90 tapes are most commonly used.
  The C-120 tapes are not recommended because their mechanical and electrical specifications vary.

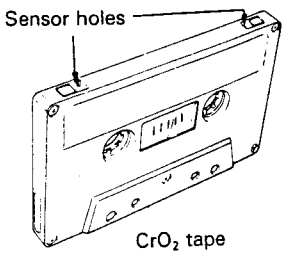
REGARDING THE TAPE CASSETTE SENSOR HOLES

This unit is equipped with an automatic tape selector function which utilizes the sensor holes on the tape cassette to determine the type of tape being used, in order to set the deck to match the tape's recording bias and equalization.

- Do not use FeCr tapes with this unit.
- When using metal tapes, be sure the tape cassettes have sensor holes.



Metal tape



CrO_2 tape

MAINTENANCE

CLEANING THE HEAD, PINCH ROLLER AND CAPSTAN

The heads, pinch roller and capstan are parts which are liable to get dirty quite easily. In particular, if the heads are dirty, the high-frequency components are not reproduced and the stereo balance is impaired, resulting in a deterioration in the playback sound. It is therefore recommended that the head section be cleaned regularly.

1. Depress the EJECT button and open the cassette door.
2. Dip the cleaning swab into the cleaning fluid and use it to wipe the heads, pinch rollers, and capstans.

To clean the pinch roller while it is rotating:

Press the detector pin in the cassette door. Next, press either the forward play switch (►) or the reverse play switch (◄).

- If the reverse mode is selected, the pinch roller will rotate for about four seconds only. Press the reverse play switch (◄) again and the pinch roller will rotate again.
- After cleaning the pinch roller while it is rotating, press the stop switch. The cassette door can be closed only in the stop mode.
- The illustration shows the position of the detector pin in deck II. The detector pin in the door of deck I is located on the opposite side (the right side of the transport mechanism).

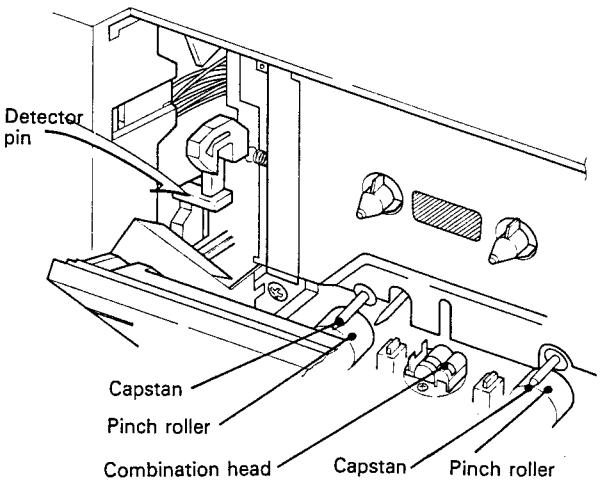
NOTE:
Do not load a tape after cleaning the head section until the cleaning fluid has completely dried (this takes two or three minutes).

CLEANING THE FRONT PANEL SECTION

Wipe the front panel and the cassette door when dusty or greasy with a soft cloth containing a small amount of ordinary washing-up liquid. Then, wipe dry with a cloth. Never use volatile spirits like thinners, benzine or alcohol because they will damage the panel's finish.

DEMAGNETIZING THE HEADS

After using the cassette deck over a period of time, the heads will become magnetized. The same effect is also caused by bringing a screwdriver, magnet or other magnetized object too near the heads. This causes loss of high-frequency sound during recording and playback, and is also a cause of interference noise. The heads should be regularly demagnetized with a head demagnetizer (eraser) which can be purchased at the dealers shops.
When demagnetizing the heads, be sure the cassette deck's POWER switch is in the OFF position. For detailed instructions, consult the operating manual for your head demagnetizer (eraser).



ENGLISH

NOISE REDUCTION SYSTEMS

This deck is equipped with three noise reduction systems, the dbx, the Dolby NR B and C types.

Dolby NR System

This system was developed in order to reduce the amount of tape hiss noise (primarily high-frequency components) produced during recording. During recording, the high-frequency pianissimo components where noise is most easily noticed are emphasized, and during playback, these emphasized components are attenuated to return the sound to normal. As a result, the noise in the parts emphasized during recording are reduced.
The Dolby NR "B" mode gives its noise-reduction effects in the high range, thus reducing tape hiss noise and expanding the dynamic range. Dolby NR "C" produces its noise-reduction effects from the mid-ranges on up, thus achieving an even greater degree of noise reduction compared to the Dolby NR "B" type.

dbx system

The dbx system is provided to expand the dynamic range by encoding and decoding sound signals across the entire signal spectrum. During recording, the input signal is encoded and recorded at one-half normal level. At time of playback, the signal recorded at one-half level is decorded at twice normal level, thus returning the signal to normal. Since large and small signals are decoded in proportion to their size, the dynamic range is greatly improved, and tape noise is reduced.

TROUBLESHOOTING

Apparent malfunctions are often caused by faulty or incorrect operation. If you think that something has gone wrong with your unit, check out the points in the list below.
The trouble may lie in another component. Check the stereo amplifier, speaker and other appliances being used.
If the trouble is not remedied after checking the points below, contact your dealer and ask for help.

Symptom	Probable cause	Remedy
Tape does not travel.	• Power cord is loose or unplugged.	• Plug the power cord firmly into an AC outlet.
	• Deck is in the pause mode.	• Press the pause switch (■■) again.
	• Cassette tape is improperly loaded.	• Load the cassette tape properly.
No sound.	• Connections with amplifier are incorrect.	• Check connections, and reconnect loose or disconnected cords.
	• No sound is recorded on tape.	• Replace with pre-recorded tape.
	• The amplifier volume controls are incorrectly adjusted.	• Set amplifier controls to correspond to signal level of tape.
Unit will not record.	• Accidental erasure prevention tabs on cassette are broken off.	• Replace with another cassette, or cover the tab holes with adhesive tape.
	• The REC LEVEL control is set to minimum position.	• Set the REC LEVEL control to the proper level.
	• Heads are dirty.	• Clean the heads.
High frequency sound is not reproduced.	• Heads are dirty.	• Clean the heads.
	• Tape recorded without noise reduction is being played back with the NOISE REDUCTION switch in the ON position.	• Set the NOISE REDUCTION switch to the OFF position.
	• Heads are magnetized.	• Demagnetize the heads.
Sound is distorted.	• Heads are dirty.	• Clean the heads.
	• Recorded program itself is distorted.	• Replace with another cassette tape.
	• Recording level is set too high.	• Set the proper recording level.
Sound wavers or speeds up.	• The heads, pinch roller and capstan are dirty, or the cassette tape is wound too tightly.	• Clean heads, capstan, and pinch roller. • Rewind tape on fast forward or rewind.
High noise level.	• Heads are magnetized.	• Demagnetize the heads.
	• Heads are dirty.	• Clean the heads.
	• Using a tape with a high noise level.	• Use another tape.
	• Loose cord connections.	• Check each INPUT and OUTPUT cord and connect firmly.
	• Recording level is set too low.	• Set proper recording level.
High-range sounds are overemphasized.	• Tape recorded with noise reduction is being played back with the NOISE REDUCTION switch in the OFF position.	• Set the NOISE REDUCTION switch appropriately.
No erasing.	• Heads are dirty.	• Clean the heads.
	• The REC LEVEL control is not set to minimum position.	• Set the REC LEVEL control to minimum position.
Random programmed playback, skip search and music search do not operate.	• The non-recorded interval between programs is not 4 seconds long.	• Use a cassette with non-recorded intervals of at least 4 seconds.

DEW CONDENSATION

When the unit is moved from a cold to a warm room, or a quick temperature change occurs, condensation will form on the mechanical parts affecting performance of the unit. In such cases, leave the unit in a warmer atmosphere for approximately one hour, or gradually change the room temperature.

NOTE:
When locating the tape deck, do not place a cloth over the top or block the ventilation openings in any other way.

SPECIFICATIONS

Systems ..... 4 track, 2-channel stereo
Heads ..... "Hard Permalloy" recording/playback head x 2
"Ferrite" erasing head x 2
Motor ..... DC servo motor x 2
DC reel motor x 2
DC assist motor x 2
Wow and Flutter ..... No more than 0.06% (WRMS)
No more than ± 0.16% (DIN)
Fast winding Time ..... Approximately 100 seconds (C-60 tape)
Frequency Response
−20 dB recording:
Normal tape ..... 25 to 17,000 Hz
Chrome tape ..... 25 to 17,000 Hz
Metal tape ..... 25 to 18,000 Hz
0 dB recording:
Chrome tape ..... 25 to 9,000 Hz
Metal tape ..... 25 to 14,000 Hz
Signal-to-Noise Ratio
Dolby NR OFF ..... More than 57 dB
dbx ON ..... 92 dB
Noise Reduction Effect
Dolby NR B type ON ..... More than 10 dB (at 5 kHz)
Dolby NR C type ON ..... More than 19 dB (at 5 kHz)
Dynamic range (dbx ON) ..... 110 dB
Harmonic Distortion ..... No more than 1.0% (0 dB)
Input (Sensitivity)
LINE (INPUT) ..... 63 mV (Input impedance 78 kΩ)
Output (Reference level)
LINE (OUTPUT) ..... 316 mV (Output impedance 4.6 kΩ)
Headphone ..... 0.24 mW (Load impedance 8 Ω)

Subfunctions

- Relay recording
- Relay playback
- Random programmed playback (Deck I)
- High-speed and normal-speed tape copying (Deck I → Deck II)
- Random programmed tape copying (high speed and normal speed, Deck I → Deck II)
- Parallel recording (Deck I, II)
- Skip search/music search (Deck I, II)
- Noise reduction systems (dbx, Dolby NR B/C types)
- Auto tape selector (Deck I, II)
- Timer function (Unattended recording: Deck I→ Deck II) (Wake-up playback: Deck I only)
- Headphone jack
- Automatic recording mute function
- Level meter
- Tape counter (Deck I)

Miscellaneous

Power Requirements
KU, KC models ..... AC 120 V, 60 Hz
HEM model ..... AC 220 V, 50/60 Hz
HB, HP models ..... AC 240 V, 50/60 Hz
D, D/G models ..... AC 120 V/220 V/240 V, 50/60 Hz (switchable)
Power Consumption
KU, KC models ..... 37 W
HEM, HB, HP models ..... 37 W
D, D/G models ..... 29 W
Dimensions (Except for D/G model) .....
420 (W) x 101 (H) x 315 (D) mm
16-9/16 (W) x 4 (H) x 12-6/16 (D) in
(D/G model) ..... 458 (W) x 102 (H) x 315 (D) mm
18-1/16 (W) x 4 (H) x 12-6/16 (D) in
Weight [(without package) except for D/G model] .....
6.4 kg (14 lb 2 oz)
[(without package) D/G model] ..... 7.2 kg (15 lb 14 oz)

Accessories

Operating instructions 1
Connection cord with pin plugs 2
Control cord (Only D/G model) 1

NOTE:
Specifications and design subject to possible modifications without notice due to improvements.

ENGLISH

INFORMATION TO USER [FOR U.S.A. MODEL]

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate this component with respect to the receiver
- move this component away from the receiver
- plug this component into a different outlet so that component and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:
"How to Identify and Resolve Radio-TV Interference Problems".
This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

The above instructions apply only to units which will be operated in the United States.